Deploying Deepclean in O4

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Deepclean Online Test

- We have two triton servers (Academia Sinica, NCHC) ready.
- **Deepclean** installed, **Train**, **Export** functions work.
- **Infer** function has been tested on the triton server and there are some issues to be solved.
- Using Deepclean to clean 60Hz noise from the **MDC** data and optimize Deepclean (Training, Latency, PE).
- Study multi-component noise subtraction: 60Hz noise and low-frequency noise using 8-sec kernel, and then online cleaning on 1-sec frame files.
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- Using the online test of cleaning MDC data to demonstrate the prototype of GW-IaaS pipeline.
- Low-latency tests of Deepclean and GW-IaaS during O4 (60Hz, low-frequency in LIGO).
- Preparation for hardware and infrastructure.
- Collaboration with CompSoft, CAL, DetChar, PEM teams would be necessary.
- Using Low-latency data stream before or after CAL?
- Collaboration with low-latency detection pipeline.
- Further plans or goals for O4?
Appendix
Reaching out to PEM and low-latency teams in KAGRA

- PEM team: Kume, Itoh, Yokoyama, **Washimi**, Yokozawa
- Comparison to **Independent Component Analysis (ICA)**
- Find out the noise in other frequency bands and the relevant witness channels. (PEM team, Data Analysis team)
- Data Analysis team, detector characterization: **Yuzurihara**
- Data Analysis team, low-latency search or MMA: **Ueno** (GstLAL, All-sky CBC search)
Physical Environmental Monitors

- Seismometers, Accelerometers, Microphones, Magnetometers, Voltmeters, Thermometers, Weather station, Lightning sensor
- Known noises: 17.2Hz, 44Hz, 160Hz, 280Hz, 360Hz
- Geophysics interferometer (GIF):
  - Unique features in KAGRA to measure the ground motions along the arms.
Other Denoising method in KAGRA: ICA

- Independent Component Analysis (ICA) on the acoustic noise:
  - 363Hz, 372Hz, 402Hz
- Power main noise:
  - 60Hz, 120Hz
- From the slides of F2F meeting on 2020/12/19.
- The channel used: “K1:DAC-STRAIN_C20”, ”K1:PEM-MIC_PSL_TABLE_PSL4_Z_OUT_DQ”
- Kume, Itoh, Yokoyama, Washimi, Yokozawa